

Weekly Report

12/22/2014 - 12/28/2014

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1 Summary

This week I mainly focus on the data inspection project.

2 Projects

2.1 Project 1 - Rank Visualization

We finished all sections of the paper except for user study evaluation. Since the deadline is postponed to March, we decided to conduct a formal user study and a formal evaluation. We attach the current version as a complementary material.

2.2 Project 2 - Data Inspection

Based on the major contributions stated in the previous weekly report, we further elaborate the layout process here. Instead of the existing graph-based similarity measurement of scatterplot [4, 2], we would evaluate distribution of two dataset in an image way. We initialize a 2D distribution with scatterplot, and compute its similarity with other scatterplot with image-based shape matching method [1]. However, in visualization we may change the scatterplot into any other forms. And we can also define the correlation between a 2D dataset and its underlying 1D data, say the correlation between dataset AB and A/B. With such correlations defined, we can generate the quartets and adopt the method in [3] to eventually generate a hierarchical relationship among all views.

For the glyph-based view descriptor, we would refer to Leland Wilkinson's paper about Graph-Theoretic Scagnostics [4] and TimeSeer [2]. Applying the image-based shape matching method, we also define the shape feature of the underlying dataset, and present the shape with an abstract/symbolic glyph.

I will start tryouts of the process mentioned above to see if it works.

2.3 Project 3 - NBA Game Visualization

We divide the visualization of an NBA game into 4 parts:

- Score Difference Chart, which concerns regression or not, scaling or not,
- Player Chart, which not only includes when players start/end their roles but also their switch relations;
- Event View, which includes shooting, foul, turnover, miss, steal, rebound, blocking, etc;
- Video Clip, which are obtained from video processing techniques and snapshots of events mentioned above.

Our basic design is based on the score difference chart and we want to encode more details to where there happens dramatic score difference. See Figure 1, the score difference chart is segmented into blocks according to its trend after regression. The size of the block indicates the score difference. And with larger block area, we're able to encode more information about how such score difference happens and what strategy the coach uses in the game. When users focus on one block, others would fade out, leaving more space for the events and inter-player interactions in the game field.

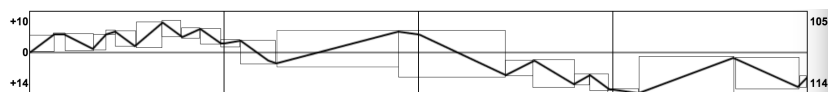


Figure 1:

Thus our design focus would be the score difference view integrated with event view and video clip. Also we have to design player graph for inter-player relationship.

3 Paper Reading

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4 Miscellaneous

First version of Topk submitted to ZUSC.

5 To Do List

1. Data inspection project — try out the process
2. NBA project discussion and data inspection project discussion.

References

- [1] Serge Belongie, Jitendra Malik, and Jan Puzicha. Shape matching and object recognition using shape contexts. *Pattern Analysis and Machine Intelligence, IEEE Transactions on*, 24(4):509–522, 2002.
- [2] Tuan Nhon Dang, Anushka Anand, and Leland Wilkinson. Timeseer: Scagnostics for high-dimensional time series. *Visualization and Computer Graphics, IEEE Transactions on*, 19(3):470–483, 2013.
- [3] Shi-Sheng Huang, Ariel Shamir, Chao-Hui Shen, Hao Zhang, Alla Sheffer, Shi-Min Hu, and Daniel Cohen-Or. Qualitative organization of collections of shapes via quartet analysis. *ACM Transactions on Graphics (TOG)*, 32(4):71, 2013.
- [4] Leland Wilkinson, Anushka Anand, and Robert L Grossman. Graph-theoretic scagnostics. In *INFOVIS*, volume 5, page 21, 2005.